

Tata

**Notice of Allowability**

Application No.

10/800,541

Examiner

Ted Kim

Applicant(s)

MAINS ET AL.

Art Unit

3746

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to \_\_\_\_\_.
2. ☒ The allowed claim(s) is/are 1-38.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☒ ~~CORRECTED~~ <sup>FORMAL</sup> DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |  |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date <u>03/15/2004</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material                                 | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|  | 9. <input type="checkbox"/> Other _____.   |

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

#### Claims

- Claim 16, line 51, "said said" has been replaced by --said-- to correct an obvious typographical error.

### REASONS FOR ALLOWANCE

2. The following is an examiner's statement of reasons for allowance: the prior art of record do not fairly teach in permissible combination the claimed invention:

"1. A fuel staging valve assembly, *for distributing fuel flow to a multiple zone nozzle in a gas turbine engine, comprised of a pilot valve operatively interconnected with at least one main valve, said at least one main valve* [preamble has been given full weight as it breaths life and meaning to the claims] comprising: a. a dual diameter valve housing; b. a dual diameter cylindrical valve sleeve fixedly, sealingly and conformably received within said valve housing, said sleeve having a first diameter portion and a second diameter portion joined via an intermediate annular portion, with a peripheral land cavity being located between said sleeve intermediate portion and an adjacent portion of said valve housing; and said first diameter portion having a peripheral, recessed, annular gland area with axially spaced first and second pluralities of discrete radial passages therethrough; c. a dual diameter hollow cylindrical valve spool, having a central cavity in communication with a source of fuel, conformably and slidably received within said cylindrical

valve sleeve, said spool having a first diameter portion and a second diameter portion joined via an intermediate annular portion, with predetermined diametral clearance spaces being provided between corresponding adjoining first and second diameter portions of said sleeve and spool, thereby permitting a predetermined amount of fluid leakage therebetween, during operation of said pilot poppet valve; and an annular pressure signal cavity, interconnected with said land cavity, being located between intermediate annular portions of said valve sleeve and said valve spool; d. a centrally apertured spring retainer fixedly received within said sleeve first diameter portion and closing one end thereof; e. a main valve spring, interposed between said spring retainer and said spool intermediate annular portion, for preloading said spool against said sleeve; f. a centrally-apertured dual diameter valve seat retainer member having a first diameter portion and a second diameter portion joined via an intermediate radial surface portion, said retainer member first diameter portion being fixedly and sealingly received within an open end of said sleeve second diameter portion, with said retainer member intermediate radial surface portion being provided with an inwardly-directed, raised, central contoured seal seat portion adjoining said retainer member second diameter portion; g. a generally cup-shaped closure member is fixedly and sealingly received on said retainer member second diameter portion and includes a central main valve discharge orifice adapted to be operatively interconnected with said nozzle; h. a multiple diameter poppet member having interconnected first, second and third diameter portions, said first diameter portion being yieldingly, slidably received within an open end of said valve spool second diameter portion, with the axial movement of said poppet member being restricted via a split retaining roll pin press-fitted relative to said valve spool second diameter portion but having a predetermined peripheral clearance relative to said poppet member; i. *a poppet spring, operatively interposed between said poppet member and a peripheral internal wall portion in said spool member second diameter portion, for axially biasing said poppet member toward said contoured seal seat portion, with said biasing being limited via said predetermined axial clearance, relative to said roll pin;* j. *a stiff, elastic, annular seal member, contoured in cross-section, fixedly retained within a mating contoured recess within said poppet member second diameter portion, having an*

*axial outer surface adapted to sealingly mate with said raised valve seat portion of said valve seat retainer member, with said third diameter portion of said poppet member, in an at-rest position, axially extending, beyond said seal member axial outer surface and in the vicinity of said seal seat portion, with at least one predetermined diametral clearance, into said retainer member second diameter portion; and k. a shim, fixedly abutting and acting on said retainer member intermediate radial surface portion, provides an initial, predetermined sealing force, relative to said seal member axial outer surface, against said retaining roll pin, thereby preventing fuel leaks at low fluid supply pressure, with said predetermined peripheral clearance, relative to said poppet member serving to limit the compression of said elastic seal member as well as allowing compensating for any seal compression set.” Nor*

“29. In a gas turbine engine, a fuel staging valve assembly, for distributing fuel flow to a multiple zone nozzle therein, comprised of a pilot valve operatively interconnected with at least one main valve, each of said valves including [preamble has been given full weight as it breaths life and meaning to the claims]: a. a dual diameter valve housing; b. a dual diameter cylindrical valve sleeve fixedly, sealingly and conformably received within said valve housing, said sleeve having a first diameter portion and a second diameter portion joined via an intermediate annular portion, with a peripheral land cavity being located between sleeve intermediate portion and an adjacent portion of said valve housing; and said first diameter portion having a peripheral, recessed, annular gland area with at least an axially spaced first plurality of discrete radial passages therethrough; c. a dual diameter hollow cylindrical valve spool, having a central cavity, conformably and slidably received within said cylindrical valve sleeve, said spool having a first diameter portion and a second diameter portion joined via an intermediate annular portion, with predetermined diametral clearance spaces being provided between corresponding adjoining first and second diameter portions of said sleeve and spool, thereby permitting a predetermined amount of fluid leakage therebetween, during operation of said pilot poppet valve; and an annular pressure signal cavity, interconnected with said land cavity, being located between intermediate annular portions of said valve sleeve and said valve spool; d. a centrally apertured spring retainer fixedly received within

said sleeve first diameter portion and closing one end thereof; e. a valve spring, interposed between said spring retainer and said spool intermediate annular portion, for preloading said spool against said sleeve; f. a centrally-apertured dual diameter valve seat retainer member having a first diameter portion and a second diameter portion joined via an intermediate radial surface portion, said retainer member first diameter portion being fixedly and sealingly received within an open end of said sleeve second diameter portion, with said retainer member intermediate radial surface portion being provided with an inwardly-directed, raised, central contoured seal seat portion adjoining said retainer member second diameter portion; g. a generally cup-shaped closure member is fixedly and sealingly received on said retainer member second diameter portion and includes a central main valve discharge orifice; h. a multiple diameter poppet member having interconnected first and second diameter portions; i. *a poppet spring, operatively interposed between said poppet member and a peripheral internal wall portion in said spool member second diameter portion*; j. *a stiff, elastic, annular seal member, contoured in cross-section, fixedly retained within a mating contoured recess within said poppet member second diameter portion, having an axial outer surface adapted to sealingly mate with said raised valve seat portion of said valve seat retainer member*; k. *a shim, fixedly abutting and acting on said retainer member intermediate radial surface portion*; l. *a fluid pilot supply conduit interconnecting said pilot and main valve central cavities at their respective gland areas*; m. *a source of fluid signal pressure connected with said pilot valve peripheral land cavity*; and n. *a fluid pressure signal conduit interconnecting said pilot and main valves at their respective peripheral land cavities, wherein the improvement comprises*: o. *said poppet member first diameter portion being yieldingly, slidably, received within an open end of said valve spool second diameter portion, with the axial movement of said poppet being restricted via a split retaining roll pin press-fitted relative to said valve spool second diameter portion but having a predetermined clearance relative to said poppet member*; p. *said poppet spring axially biasing said poppet member toward said contoured seal seat portion, with said biasing being limited via said predetermined axial clearance, relative to said pin*; and q. *said shim providing an initial, predetermined, sealing force, relative to said seal member axial*

*outer surface, against said retaining roll pin, thereby preventing fuel leaks at low fluid supply pressure, with said predetermined peripheral clearance, relative to said poppet member serving to limit the compression of said elastic member as well as allowing compensation for any seal compression set."*

While aspects of the claimed invention are known, see e.g. Dyer et al (5,448,882) for a pilot and main fuel valve and Spencer for a fuel staging valve (5,848,525), however, none of the art of record teach in permissible combination all of the claim limitations.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



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